

## PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:

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**PCT**

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

(PCT Rule 43bis.1)

Date of mailing  
(day/month/year) **18 OCTOBER 2005 (18.10.2005)**

Applicant's or agent's file reference

LG-24919-PCT

**FOR FURTHER ACTION**

See paragraph 2 below

International application No.

**PCT/KR2005/002149**

International filing date (day/month/year)

**05 JULY 2005 (05.07.2005)**

Priority date(day/month/year)

07 JULY 2004 (07.07.2004)

International Patent Classification (IPC) or both national classification and IPC

**IPC7 C08F 12/32, C08F 2/38, C08F 32/00, C08F 4/80**

Applicant

**LG CHEM. LTD.**

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

**2. FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.  
For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/KR



Korean Intellectual Property Office  
920 Dunsan-dong, Seo-gu, Daejeon  
302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Date of completion of this opinion

17 OCTOBER 2005 (17.10.2005)

Authorized officer

BAHN, Yong Byung

Telephone No.82-42-481-5531



**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/KR2005/002149

**Box No. I Basis of this opinion**

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

- ☐ a sequence listing  
☐ table(s) related to the sequence listing

b. format of material

- ☐ on paper  
☐ in electronic form

c. time of filing/furnishing

- ☐ contained in the international application as filed.  
☐ filed together with the international application in electronic form.  
☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/KR2005/002149

**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Claims	1-22	YES
	Claims	NONE	NO
Inventive step (IS)	Claims	NONE	YES
	Claims	1-22	NO
Industrial applicability (IA)	Claims	1-22	YES
	Claims	NONE	NO

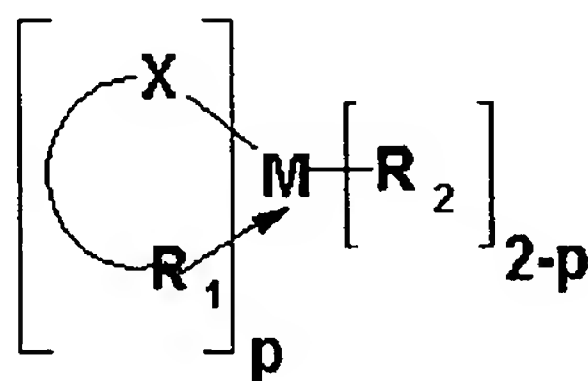
**2. Citations and explanations :**

Reference is made to the following documents:

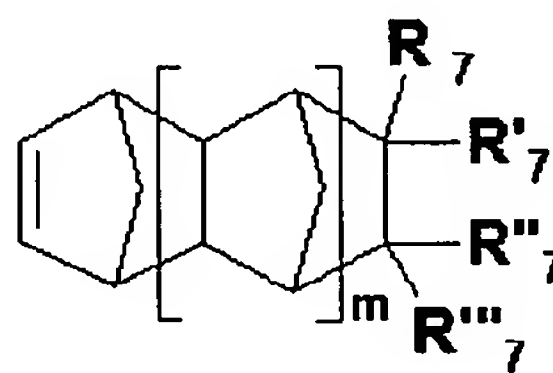
D1 : KR 2004-49946 A (LG Chem.)

D2 : KR 2004-45108 A (LG Chem.)

The present invention according to claims 1-22 relates to a method of producing cyclic olefin polymers using a catalyst composed of a Group 10 metal compound[chemical formula(1)] and a phosphonium salt compound, and addition-polymerizing cyclic olefin monomers[chemical formula (3)] having polar functional groups at a temperature of 80-150 °C; olefin polymers produced using the method; and an optical anisotropic film comprising the same.



Chemical formula(1)



Chemical formula(3)

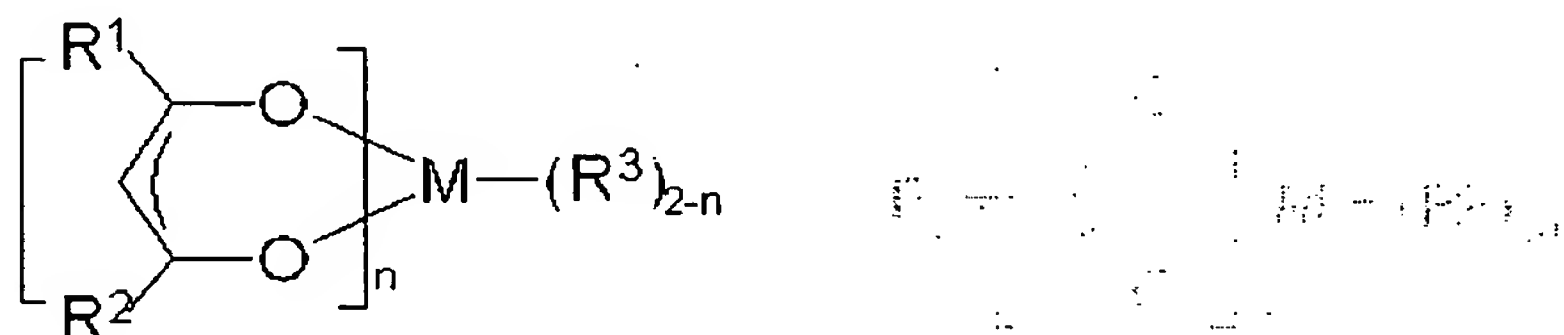
Document D1 discloses a process for producing a cyclic olefin polymer containing a polar functional group in a high yield and a high molecular weight. This cyclic olefin polymer is produced by addition-polymerizing a norbornene monomer containing the polar functional group in the presence of a catalyst system at 80-130 °C, wherein the catalyst system contains a 10 group transition metal compound as a catalyst represented by the formula A or A', an organic compound as a first catalyst, and a salt giving an anion containing a 13 group element as a second cocatalyst.

(Continued on the Supplemental Box.)

Supplemental Box

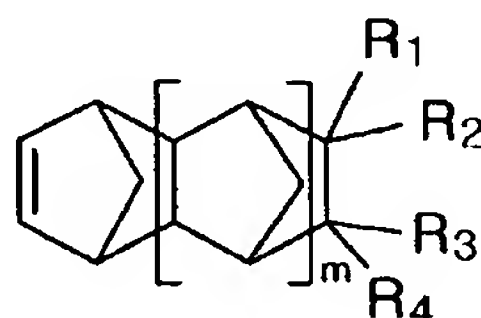
In case the space in any of the preceding boxes is not sufficient.  
Continuation of :

Box V.



Chemical formula A and A'

Document D2 discloses a negative C-plate type optically anisotropic film, its preparation method and a liquid crystal display device containing the film. This optically anisotropic film comprises a cyclic olefin-based additive polymer. Preferably the cyclic olefin-based additive polymer is a homopolymer or copolymer obtained from the compound represented by the formula B.



Chemical formula B

D1 is considered to represent the most relevant state of the art. Comparing claims 1-22 with D1, both inventions are the same in preparing a method of producing cyclic olefin polymers having polar functional groups in the presence of an organic solvent and a catalyst mixture. Also, it has been already known in the prior art D2 that the additive compound represented by formula B can be used as a cyclic olefin monomer, instead of chemical formula(3) in D1.

Therefore, the subject matter of the present invention appears to be suggested by D1 and D2 and it is obvious for the person skilled in the art to combine D1 with D2. So, claims 1-22 are trivial and not capable of supporting the requirements of inventive step under PCT Article 33(3).

Consequently, claims 1-22 are novel and also appear to be industrially applicable, but not inventive.